

CLAIMS

What is claimed is:

1. A shutter mechanism for a camera including a release button, comprising
a shutter base component defining a lens aperture opening of a first size
5 therethrough;
a main shutter blade pivotally fixed to close over a portion of said lens aperture
opening;
a supporting shutter blade moveably fixed to close over a portion of said lens
aperture opening;
10 a drive mechanism operated in response to actuation of the release button,
wherein said drive mechanism simultaneously moves said main shutter blade and said
supporting shutter blade between an open lens aperture position and a closed lens
aperture position; and
wherein said main shutter blade covers a substantially greater percentage of said
15 lens aperture opening than does said supporting shutter blade.
2. The shutter mechanism of claim 1, wherein said main shutter blade and
said supporting shutter blade are normally open to expose said lens aperture opening to
light and wherein said drive mechanism is operated to close said main shutter blade and
20 said supporting shutter blade over said lens aperture opening in response to actuation of
the release button.
3. The shutter mechanism of claim 2, wherein said drive mechanism includes
a first solenoid and a first solenoid drive pin, said first solenoid drive pin being in
25 communication with said main shutter blade.
4. The shutter mechanism of claim 3, wherein said first solenoid drive pin is
additionally in communication with said supporting shutter blade in order to slide said
supporting shutter blade linearly when said first solenoid drive pin is moved.

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5. The shutter mechanism of claim 4, additionally including a main aperture blade pivotally fixed to close over a portion of said lens aperture opening and a supporting aperture blade fixed to close over a portion of said lens aperture opening, said main aperture blade being located in a different plane from said main shutter blade and including a hole therethrough, wherein said main aperture blade covers a substantially greater percentage of said lens aperture opening than said supporting aperture blade when closed over said lens aperture opening.

6. The shutter mechanism of claim 5, wherein said drive mechanism additionally includes a second solenoid and a second solenoid drive pin in communication with said main aperture blade and said supporting aperture blade.

7. The shutter mechanism of claim 6, additionally including an aperture operating mechanism that operates said second solenoid to simultaneously move said main aperture blade and said supporting aperture blade to change the size of said lens aperture opening and after moving said main and supporting aperture blades, operates said first solenoid in response to actuation of the release button, to simultaneously close said main and supporting shutter blades.

8. The shutter mechanism of claim 1, wherein said shutter mechanism additionally includes an alignment system and a damping system, said alignment system including a guide rail which passes through an alignment hole on said shutter base component to align said shutter base component on said optical axis, and wherein said damping system includes a spring connected between said shutter base component and a fixed point in said camera.

9. The shutter mechanism of claim 8, wherein said alignment system further includes a second guide rail passing through a second alignment hole in said shutter base component and said damping system further includes a second spring connected between

said shutter base component and a fixed point in said camera, wherein said springs are fixed parallel to said optical axis.

10. A method of capturing an image, comprising:

- 5 (a) providing an image capture device including a lens, a release button, an image capture medium, and a shutter optically aligned between said lens and said image capture medium, said shutter including,
- a shutter base component defining a lens aperture opening of a first size therethrough;
- 10 a main shutter blade pivotally fixed to close over a portion of said lens aperture opening;
- a supporting shutter blade moveably fixed to close over a portion of said lens aperture opening;
- a drive mechanism that simultaneously moves said main shutter blade and
- 15 said supporting shutter blade between an open lens aperture position and a closed lens aperture position; and
- wherein said main shutter blade covers a substantially greater percentage of said lens aperture opening than does said supporting shutter blade;
- (b) activating said release button; and
- 20 (c) moving said main shutter blade and said supporting shutter blade simultaneously in response to activation of said release button.

11. The method of claim 10, wherein said image capture medium is electronic image sensor and wherein said main shutter blade and said supporting shutter blade are

25 normally open and said drive mechanism closes said main shutter blade and said supporting shutter blade over said lens aperture opening in response to actuation of said release button.

12. The method of claim 11, wherein said drive mechanism includes a first

30 solenoid and a first solenoid drive pin engaged with said main shutter blade and with said

supporting shutter blade to pivot said main shutter blade and slide said supporting shutter blade over said lens aperture opening in response to actuation of said release button.

13. The method of claim 12, additionally including a main aperture blade
5 pivotally fixed to close over a portion of said lens aperture opening and a supporting aperture blade fixed to close over a portion of said lens aperture opening, said main aperture blade being located in a different plane from said main shutter blade and including a hole therethrough, wherein said main aperture blade covers a substantially greater percentage of said lens aperture opening than said supporting aperture blade when
10 closed over said lens aperture opening.

14. The method of claim 13, wherein said drive mechanism additionally includes a second solenoid and a second solenoid drive pin in communication with said main aperture blade and said supporting aperture blade.

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15. An image capture device having a rotary to linear switch, comprising:
an image capture device housing including a window therethrough and a detent assembly in fixed relationship therewith;
a linear switch including a switch actuator, said linear switch located within said
20 image capture device housing and having a plurality of discrete switch positions determined by the position of said switch actuator;
a switch gear located outside said image capture device housing and rotatably affixed thereto, said switch gear being linked with said switch actuator through said window, wherein said switch gear includes an open portion on the inner circumference thereof, said detent assembly being located within said open portion, and wherein said
25 open portion includes a plurality of detent notches, each one of said detent notches corresponding to one of said plurality of discrete switch positions;
wherein rotation of said switch gear moves said switch actuator linearly between said plurality of discrete switch positions; and

wherein said switch gear is locked into place at a desired discrete switch position by said detent assembly engaging one of said detent notches corresponding to said desired discrete switch position.

5 16. The image capture device of claim 15, wherein said switch gear includes fixed thereto a projection which passes through said window and engages said switch actuator.

10 17. The image capture device of claim 16, wherein said detent mechanism includes a spring and a detent cap, wherein said detent cap is spring biased by said spring to cooperate with said detent notches.

15 18. The image capture device of claim 17, wherein said camera housing includes a bearing surface upon which said switch gear is mounted, said bearing surface including a walled channel located within said open portion of said switch gear, at least a portion of said spring being located within said walled channel.

20 19. The image capture device of claim 18, further including a joystick nested within the center of said switch gear.

 20. The image capture device of claim 19, wherein said joystick is a five position joystick.